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Hinesburg, state of Vermont, the town of Colchester, state of Vermont, the town of St. Albans, state of Vermont, and the town of Winooski, state of Vermont, have made a certain new and useful invention in a Process For Ring-Dyeing Filaments of which the following is a specification.

SPECIFICATION

FIELD OF THE INVENTION

The invention relates generally to a continuous process for fabricating and ring-dyeing filaments such as those used in consumer and industrial products such as toothbrushes, hairbrushes, paint brushes, household brushes, janitorial and cosmetic brushes and vacuum cleaner brushes. Ring-dyeing refers to a process wherein a filament is fed into a tank containing a dye solution and held therein for a predetermined period of time to provide a ring-dyed filament having an outer cross-sectional region colored with the dye and an inner cross-sectional region not colored with the dye. Alternatively, the ring-dying processes of the present invention may be employed to provide a filament having multiple ring-dyed layers, each layer having a different color. For example, the filament could be dyed with a first, highly absorbable dye or pigment of a selected color, e.g., red, that penetrates the filament surface and extends across a substantial portion, but not the entire cross-section of the filament, and dyed with a second, less absorbable dye or pigment of a different selected color, e.g., blue, that penetrates the filament surface and extends across a less substantial portion of the filament cross-section. The resulting filament would include two ring-dyed layers, each having a different color, and an undyed central core. In this manner, during use, a first change in filament color indicates a first degree of filament wear, and a second change in filament color indicates a second, more severe degree of filament wear. Alternatively, rather than relying upon the varying rates at which dyes are absorbed in a filament to obtain varying degrees of dye penetration,